

Self-Healing Inflatable, Rigidizable Shelter for the Lunar Environment, Phase I

Completed Technology Project (2008 - 2008)



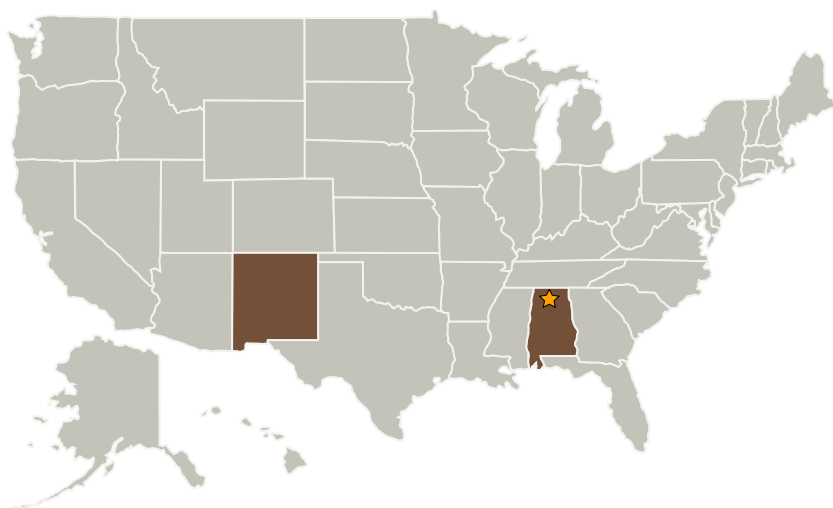
Project Introduction

Any manned missions to extraterrestrial locations will require shelter structures for a variety of purposes ranging from habitat usage to biomass production. Such shelters need to be constructed in such a way to minimize stowed volume and payload weight. The structures must also be very durable and have the ability to survive punctures without collapsing. Ways of increasing available crew-load volume without greatly increasing launch weight or volume are also sought. Inflatable structures are ideal candidates for habitat structures for several reasons: (1) they feature the low stowage volume and payload weight required, (2) deployed volume can be easily increased without large increases in launch weight or volume, (3) they offer unique opportunities for incorporating intelligent and/or multifunctional systems such as self-healing capability, power generation and storage, sensor systems, and radiation protection. Adherent Technologies, Inc. is proposing an inflatable, rigidizable shelter system based on our Rigidization on Command

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(ROC) technology. The proposed shelter system would feature not only the required low stowage volume and lightweight character, but would also feature a self-healing foam system incorporated into the final structure to minimize the damage caused by any potential punctures to the structure. Additional features will be incorporated in the Phase II follow-on, including thin film photovoltaics to provide power for the lighting system and later habitat function, sensor systems for monitoring both structural and crew health, and radiation protection systems.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Marshall Space Flight Center (MSFC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★ Marshall Space Flight Center(MSFC)	Lead Organization	NASA Center	Huntsville, Alabama
Adherent Technologies, Inc.	Supporting Organization	Industry	Albuquerque, New Mexico

Primary U.S. Work Locations

Alabama	New Mexico
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Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Andrea Hoyt Haight

Technology Areas

Primary:

- TX07 Exploration Destination Systems
 - └ TX07.2 Mission Infrastructure, Sustainability, and Supportability
 - └ TX07.2.3 Surface Construction and Assembly